Space Weather Forecast

Issued on Friday, 02 February 2024 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of isolated R1/R2 Radio Blackouts. Coronal Mass Ejection arrival expected, most likely late day 2 (3rd) or early day 3 (4th), with Minor to Moderate geomagnetic storms likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with several Common class flares, the largest of which was a long duration flare from an area of high energy in the northeast quadrant of the Sun, peaking at 01/0743 UTC. This flare produced a Coronal mass ejection (CME), which has been analysed as being Earth-directed. There are currently seven sunspot regions on the visible disc, two of which are noteworthy. AR3567 in the northeast remains the largest region on the disc, and along with AR3565 and AR3573 is moderately magnetically complex, each region with moderately complex magnetic structure. Most remaining sunspot regions appear to be small and stable, or in decay.

In addition, to the previously mention CME, two further CME's have been seen leaving the Sun during the past 24 hours, one weak CME to the southeast during the morning and another more substantial CME from the far northwest in the evening. Currently both CME's are awaiting analysis, but are not thought to be Earth-directed.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of a weak and waning coronal hole fast wind, from slightly elevated to slow-ambient levels, before rising again to slightly elevated levels following the arrival of a weak CME (which left the Sun on 29 Jan). Wind speeds ranged from 390 to 460km/s throughout the period, declining to background levels after the passage of the weak CME. The strength of the solar winds magnetic field was mostly weak, but briefly rose to moderate levels following the weak CME arrival, with the all-important north-south component, also varying weakly. The net result of the above solar wind measures was Quiet geomagnetic activity, despite the glancing blow from a CME early in the day.

Energetic Particles / Solar Radiation: High energy proton flux is at slightly elevated levels, but remains below the S1/Minor Storm threshold. There is a nominal risk of exceeding the S1 threshold during the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Is expected to be Low, but with a chance of increasing to Moderate with isolated Moderate-class flares, most likely from the two largest regions in the northeast disc. However, later in the forecast period new or returning regions are expected to rotate onto the disc, which may increase solar activity.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Space Weather Forecast

Solar Wind / Geomagnetic Activity: Solar winds are currently at background levels. A CME from the 31 Jan may give a glancing blow at Earth either on day 2 or 3 (3rd or 4th Feb), although this is low confidence. There is higher confidence for the next CME, from the 1st Feb, to be Earth-directed, but lower confidence for the arrival time. The CME is most likely to arrive either late tomorrow or early day 3. The next anticipated coronal hole enhancement is from a coronal hole n the southern hemisphere. This may become weakly geo-effective from day 2 (3rd) but the majority of the solar wind enhancement is expected to be on day 4 (5th Feb), with solar wind speeds reaching 450-500 km/s. Geomagnetic activity is expected to remain Quiet today. From tomorrow Quiet to Unsettled conditions are expected, with occasional Active periods expected and isolated Minor to Moderate geomagnetic storms from late tomorrow through day 3 (4th).
Energetic Particles / Solar Radiation: High energy proton flux is expected to remain below the S1/Minor Radiation Storm level, with a nominal risk of exceeding the S1 threshold during the period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	50	70	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	45	45	45	45
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.